

Analysis of Key Points of Urban Residential District Planning and Design Based on Ecological Concept

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Abstract: The global environment is deteriorating day by day. In order to improve the effective utilization of energy and resources, urban planning has gradually shifted from a single natural environment to an overall ecological environment. With the value orientation of urban sustainable development as the design, how to introduce the idea and technology of ecological design into the city has become a very meaningful problem. From the perspective of ecological concept, this paper defines ecological residential quarters, briefly explains the key problems in planning and system design, and integrates ecological concept into urban design. To solve the contradiction between urbanization and natural resources and ecological environment, and to realize sustainable development, energy and resources must be rationally allocated.

1. Introduction

At present, the design of urban residential buildings in China pays more and more attention to ecology, follows the principle of sustainable development and ecological concept, rationally plans and designs the internal and external space of residential quarters, tries to balance and utilize the environment inside and outside the residential quarters, improves the energy efficiency, reduces the damage to the environment, and creates a natural, comfortable and warm living environment. At the same time, we should know the role of biological factors in the ecosystem of residential areas, improve the ecological level of communities, truly achieve the harmonious coexistence between man and nature, save resources, reduce environmental pollution, and further improve the ecological environment. Therefore, ecological planning and design has gradually become the mainstream of urban development.

2. Analysis of Urban Residential District Planning and Architectural Design under the Ecological Concept

In the planning and construction of urban residential quarters, combined with the ecological concept, it is necessary to comprehensively analyze the greening structure, water-saving structure, energy-saving structure and waste treatment structure to ensure that the design of buildings meets the requirements of ecological development. Usually, in the process of planning and design, it is necessary to ensure that the green area in urban residential areas is within the standard range, and the per capita green area has been improved in all directions. In the process of planning and design,

materials with certain permeability and water retention must be used to build natural drainage facilities, so that rainwater and stagnant water can quickly permeate, which can not only prevent the influence of stagnant water, but also improve the recovery rate of sewage and rainwater through the purified water system, which can save energy and protect the environment to a certain extent.

3. Principles of Urban Residential Area Planning

(A) Residential integrity

The planning and design of residential quarters plays an important role in landscaping. It is an important embodiment of the overall image of the city. Therefore, the planning and design of residential quarters should follow the principle of “harmony” and maintain the overall style of residential quarters. The structure is the main body, and all outdoor environment designs should be carried out around the outdoor environment. Combine the environment with the main building to achieve overall environmental coordination, and avoid some urban residential areas as the main components of the building ^[1].

(B) Safe application

The planning and design of urban residential quarters should be farsighted. Because different people need different living conditions, designers should pay attention to the details of the design, so that residents can enjoy a comfortable living environment in life and get a kind of spiritual comfort. At the same time, we should continue to optimize the design work to meet the future trend and leave enough space for community development. The design of residential quarters should follow the principles of economy, safety and practicality. The planning and construction of residential areas should be compatible with the level of economic development and people's living standards, and the construction cost should be reasonably controlled on the basis of meeting residents' needs. It is not necessary to deliberately increase the risk of labor, so as to avoid increasing the cost due to unreasonable plans.

(C) Road and landscape optimization

The planning and design of urban residential areas should ensure smooth roads to facilitate people's travel; Divide motor vehicle lanes and sidewalks to improve community traffic safety and avoid traffic congestion. In addition, the planning and design of residential quarters should adhere to the principle of adapting to local conditions, with unified layout and rational spatial distribution, and the overall community environment should make residents feel relaxed. Residential landscape planning can create a quiet, warm and beautiful ecological environment for the community. Landscape design should be consistent with local cultural customs and natural environment to avoid abrupt. In terms of style, we should properly maintain the diversity of landscape, create ecological living space, and make the building harmonious with the surrounding environment.

(D) Economy, safety and applicability

On the basis of ecological concept, the planning and design of urban residential quarters should be forward-looking. The needs of the living environment are different. Therefore, in the planning and design of the house, attention should be paid to details, so that more people can enjoy the comfort of the environment and be comforted psychologically. The planning and design of residential quarters should follow the economy, safety and applicability, and also meet the local economic development and people's needs. Control the construction cost within a range, try not to deliberately create artificial scenery, and avoid the rise of construction cost caused by unreasonable planning.

4. Elements of Urban Residential Area Planning and Design

4.1 The Overall Design

When designing a residential area project, the relationship with the local overall environment should be fully considered, and it is forbidden to build rigid barracks-style buildings, which embodies the principle of people-oriented and sustainable development in the architectural design of the community. The construction facilities of this residential area mainly provide services for local residents. Therefore, the principle of humanization and humanization should be fully reflected in the planning and design to meet the living needs of different levels. At the same time, according to the specific situation of residents, housing planning and design should not only provide complete infrastructure for residents to enrich their ideological life, but also create a high-quality leisure place, enhance communication and exchange among residents, and further create a harmonious atmosphere in the community.

4.2 Reasonable Positioning

The construction of urban residential quarters is closely related to its surrounding environment and the development planning of the whole city. Therefore, in the planning and design of residential quarters, we should not only meet the needs of urban development, but also comprehensively measure the actual situation of the community to ensure that it will not affect the ecological environment, and adopt advanced technology to formulate reasonable planning and design. Design plays an important role in planning and design. Therefore, advanced design ideas and methods should be combined to improve the overall planning and design level of the community. In the design of some special facilities and buildings in the community, we should investigate the situation on the spot and make the best use of the value of these facilities and buildings, rather than simply furnishings and decorations.

4.3 Environmental Design

1). Strengthen the coordination of environmental design and give full play to ecological functions.

Based on the concept of eco-environmental protection, the landscape design of residential quarters should be guided by ecology. On the premise of not damaging the ecology, system of ecological civilization should be established, energy-saving, environmentally-friendly and low-energy-consuming building materials should be selected, and waste materials should be reused and designed, so as to reduce the environmental pollution caused by construction waste. Designers should follow the principle of adapting to local conditions and using it nearby to minimize the damage to the original space environment. Try to improve the coordination of indoor environment and provide a safe, comfortable, beautiful and ecologically harmonious living environment.

2). Scientifically and rationally plan the environmental composition and improve the environmental quality.

The planning and design of urban residential areas should be organically combined with the overall development planning of the surrounding areas. Therefore, when planning residential areas, it is necessary to carry out scientific and reasonable planning design and analysis to ensure that it will not bring negative impact to the ecological environment, context and space of the city. The combination of environmental spaces with different dimensions and levels enriches different spatial languages and improves the spatial quality of the environment. For example, using multi-scale plants to define different ecosystems and create a rich ecological environment is conducive to the

healthy development of natural ecosystems in communities. At the same time, when considering the relationship between architecture and environment, we must adhere to humanization as the keynote, which fully demonstrates the affinity and diversity of ecological concepts in residential communities.

4.4 Cultural and Forward-Looking

While pursuing the quality of living environment, it is also essential to pay attention to the culture of space environment. According to Maslow's hierarchy of needs theory, people's physiological needs belong to a lower level, while their spiritual needs are higher. Space quality refers to people's spiritual needs, and space environment is the spiritual needs of human beings. The residential space environment with cultural characteristics can make people feel the local spirit in the community, and form their identity with it. Considering the cultural factors, the planning of residential areas must be forward-looking, not only in terms of functions, but also in terms of ecological space planning. Modern MOMA in Beijing, designed by Steve Hall, can not only meet people's living needs, but also set up cultural exhibition facilities such as art studios, art galleries, libraries, etc., integrating art and culture into living space, so that residents can have a sense of identity with the space environment of the community; At the same time, modern MOMA is also thinking about and studying the future urban residential model. It has made forward-looking planning not only on the combination of functions, but also on community socialization, energy utilization, ecological protection and community sharing ^[2].

4.5 Follow the Key Points of Coordination.

At present, China's urban residential quarters have become an important part of landscaping, which can intuitively show the external image of a city. Once the planning and design of residential quarters cannot be coordinated with the landscape of the whole city, it will lead to unreasonable design. Therefore, in the process of planning and design, we must abide by the basic principle of coordination, that is, to ensure that the residential quarters are in harmony with the landscape environment of the whole city, and at the same time, to ensure that the main building in the residential quarters is in harmony with the surrounding ecological environment. Only in this way, with the cooperation of each other, the concept of environmental protection and its application value can be fully reflected.

5. Suggestions on the Planning and Architectural Design of Urban Residential Quarters under the Ecological Concept

5.1 Focus on Positioning

The planning, architecture and surrounding environment of most urban residential quarters in China, even the development planning of the whole city, are closely related. Therefore, in the planning process, while ensuring the consistency with the whole urban development plan, it is also necessary to accurately locate and deal with the situation of the community, and on the premise of not damaging the ecological environment, use advanced technology to improve the contents of the plan. As far as the present situation is concerned, the idea of planning directly affects the planning work. Therefore, it is necessary to organically combine the ecological planning idea, the environmental planning idea and the standard planning idea to improve the planning level and ensure the ecology and functionality. For example, in the planning of residential quarters, when some basic facilities and building structures are needed, the local situation should be investigated in

advance, and the functions of infrastructure and buildings should be utilized to the maximum extent, instead of being limited to planning them as decorations.

5.2 Point-to-Line and Line-to-Area to Enhance the Ecological Permeability of the Space Environment.

The planning and design of urban residential quarters based on ecological concept should comprehensively consider many factors, such as urban spatial form, historical and cultural background, interface, texture, etc., so that the whole life cycle of residential quarters has the characteristics of ecology and humanity, and it is also of great help to the ecological environment of the whole city. Respecting the urban space environment and humanistic environment is also a kind of respect for people. In the planning of residential quarters, the designer has adopted the “acupuncture-acupuncture” design, which integrates the ecological concept into different spatial atmospheres. It can not only improve the spatial environment of residential quarters, but also meet the needs of residents to improve the quality of living environment. By integrating the ecology of the living environment into the urban space, the ecology and humanization of the whole urban space environment can be improved.

5.3 Reasonable Zoning to Improve the Ecological Environment of Space.

When designing ecological space environment nodes, special attention should be paid to the protection of privacy and semi-privacy of residential users. The internal function and spatial structure of residential quarters are diverse. While improving the ecological function of urban space, there will inevitably be an intersection of ecological space node and user privacy and semi-privacy space. This kind of intersection is mainly manifested in the fields of sound vision and physical intersection. For example, the design of ecological space environment in residential quarters should take into account the privacy of users' space in environmental nodes and users in buildings, as well as the privacy of users in various environmental nodes in the space environment. It can not only reflect the ecology of space, but also meet people's needs. It can also reflect the humanized space environment. At the same time, it respects the living area and urban space environment, cultural history, urban texture, and more respect for users, which is also an important content in the ecological design idea of modern residential buildings ^[3].

5.4 Ecological Community

According to the concept of sustainable development, modern society should gradually think about how to transform and develop ecological communities, create a good living space for community residents, and ensure the survival of people living here and the harmonious development of ecological environment. Therefore, in the process of planning and design of residential quarters, it is necessary to rationally develop the green space and properly adjust the green space area, temperature and humidity of residential quarters. Cities should reduce the impact of heat island effect and promote the development of ecological balance. Especially for the planning and design of modern residential quarters, we should make the best use of land resources and strive to achieve the best results in the construction of the smallest area. Water conservation and the best use of solar energy and wind energy resources. The investment in community construction, the classification and recycling of community living garbage promote the gradual transition from a modern community to an ecological community.

5.5 Planning Community Roads

With the development of society, economy, science and technology, the survival pressure of social groups is increasing day by day. Without a scientific design method, we can't effectively improve the living environment of the community. In the planning and design of modern residential buildings, it is necessary to consider the local actual situation and design the residential roads reasonably. To keep the air flowing in summer, the road can be parallel to the main wind direction. To resist the cold in winter, public roads should have a proper distance from the prevailing wind direction in winter to avoid the invasion of cold wind. In short, as the air duct of the community, the road planning of the community should take into account the spatial distribution and structure of green spaces and buildings, ensure the air circulation in the community and improve the air quality in the community^[4].

5.6 Increase Living Space

With the development of society and economy, a good residential environment must be built to meet people's diversified needs. At present, the architectural planning of residential quarters mostly adopts the overall layout of living space. This functional arrangement can improve the internal space of the community and better serve the needs of the citizens. Constantly expand the interior space of the house, so that residents can make the best use of living space. Therefore, reusing the land in the community increases the public space of the community, and makes the leisure activities of the community residents more colorful, so as to meet the needs of the development of a harmonious society.

6. Conclusion

From the ecological point of view, the planning and design of urban residential quarters is an important issue in the decision-making of contemporary planning, urban design, architecture, landscape architecture and even urban planning. In different disciplines, how to integrate the concept of ecology with it, so as to make the urban environment develop in an ecological, humanized and sustainable direction, is also a concern of current academic circles and society. Based on the ecological concept, this paper discusses the planning principles and architectural design points of urban residential quarters. From the aspects of community planning, architecture and environment, this paper puts forward a brand-new concept and theoretical basis, which has certain reference significance for the sustainable development of cities and towns in China and the construction of ecological civilization. Contemporary architects, planners and urban construction decision makers should incorporate ecological and green concepts into the design guidelines, and urban residents should also integrate ecological concepts into their lives, and pay attention to the space environment quality of residential areas and cities. Make the planning and design of urban residential communities ecological, rational and humanized, and promote the high-quality development of urban space environment in China.

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